University of Pittsburgh

Radiation Safety Office

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June 27, 2005

United States Nuclear Regulatory Commission
ATTN: Penny Lanzisera
Nuclear Materials Safety Section
Division of Radiation Safety and Safeguards
475 Allendale Road
King of Prussia, PA 19406-1415

P-6
MS-16

L.N. 37-00245-02
D.N. 030-02945
MCN 137196

Dear Mrs. Lanzisera

The following information is being provided as an annotated copy of your questions submitted on June 23, 2005. The Authorized User for this project has a history of working with high activities of ^{3}H -borohydride for organic syntheses. While the use of the Tri-Sorber involves greater activities, it is considered to be significantly safer because of the design of the system and the fact that the synthesis is conducted in a closed system, with recapture of the T_2. Members of my staff will be present when sources are loaded and unloaded from the unit. Initially, someone from my office will be present at each use.

ANNOTATED
RESPONSE

1. Please specify whether the depleted uranium contained in the Tri-Sorber device contains specifically licensed depleted uranium. If so, please specify your total possession limit. In addition, please note that since the Tri-Sorber is not a registered device, the tritium will be added to your license under item 6.D.

We will possess it under a general license.

2. Provide diagrams of the facility designed for handling this tritiation device (e.g., dedicated synthesis facility with device installed in a fume hood). Include schematic descriptions of the ventilation system, with pertinent airflow rates, pressures, filtration equipment, and monitoring instruments. Diagrams should be drawn to a specified scale, or dimensions should be indicated.

The room dimensions are 30 ft. x 9.5 ft. x 8.67 ft. (see attached drawing) There are 3 entries. The two side entries will remain locked from the inside. All doors will be posted.

The Trisorber will be installed in a dedicated fume hood. There are 18 air discharge risers external to the building. They feed two roof plenums and fan units. The riser labeled "Q" is associated with the laboratory in question. There is no filtration system on the discharges. The ventilation system has been newly refurbished.

There are two hoods in the laboratory each designed to draw 850 cfm. Make-up air is

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supplied at a rate of 1100 cfm. The air turnover rate is approximately 40 per hour. At this rate it would take approximately 10 minutes for a 1 curie release into the room to reach the DAC. A spilled gas clearance time of twenty minutes will be posted. The room will be maintained at a negative pressure relative to its surroundings.

All flows and pressures will be confirmed and clearance times will be adjusted if necessary.

A 1 Ci release into the room would result in an uptake of 620 μCi or less than 0.001 ALI with no evacuation. This includes skin transfer. Applying the general rule of thumb for the transfer fraction from hood to room of 10^{-6} to 10^{-7}, less than 1 μCi would be expected to enter the occupied space for each curie released.

No real time monitoring instruments will be used. (See below for a description of the air sampling program.)

3. Describe your procedures for complying with Sections 20.1203, 20.1204, 20.1302 and 20.1502 of 10 CFR Part 20, for tritium loading and tritium labeling experiments that may release gaseous radioactive materials to restricted and unrestricted areas. You should include a description of the type of surveys (e.g., environmental or breathing zone), frequency of surveys, and the individuals who will perform the surveys (e.g., radiation safety officer or investigator), and equipment to be used. If bioassay will be used for internal dose assessment, describe your bioassay program, including the type of bioassay (urine counts, etc), and the criteria and the frequency for performing bioassays.

20.1203

The external immersion dose is negligible relative to the internal dose from uptake.

20.1204 & 20.1502

As specified on Page 10.1-3 in our license application bioassays will be performed for activities exceeding 25 ALI for volatile compounds used in a fume hood. Base line and other bioassays will be conducted in accordance with Regulatory Guide 8.32. As such, bioassays will be conducted for each use exceeding 2 Ci although we would not expect that intakes exceeding 10 percent of the applicable limits would be reached, nor will the activity levels used exceed the trigger point for a bioassay program, as indicated in Table 1 of Reg. Guide 8.32. Urine samples will be collected and assayed by liquid scintillation counting.

Laboratory surveys will be conducted in accordance with Item 10.4 in our license application. Smear surveys will be performed following each use of the Tri-Sorber. Initially these will be conducted by staff of the Radiation Safety Office; however, once we establish a survey history, we will turn over the responsibility for post-procedural surveys to laboratory personnel. All other special surveys as defined in Item 10.4 will be conducted by our office.

20.1302

Expected discharges to the environment are based on engineering calculations. It is expected that the average use of the Tr-Sorber will be once per month, after the initial testing and labeling. Currently this is the only use of radioactive material in the building. Taking into consideration air flows, the number of hood per floor, the frequence of labeling, environmental release limits specified in 20.1302 and Table 2 of App. B will be easily attained at the point of discharge.

Random confirmation measurements will be conducted by sampling within the hood system and within the laboratory using wet impingers and liquid scintillation counting of the collected samples.

4. Specify the criteria used to set the type and frequency at which routine surveys for airborne licensed materials are performed (e.g., breathing zone and general work area air sampling, hood and room ventilation air flow rate measurement, and stack effluent sampling). Describe the instrumentation that will be used for sample collection and analysis.

Sampling will be conducted with each use. Ventilation conditions will be confirmed on an annual basis. An air flow indicator will be installed in the hood.

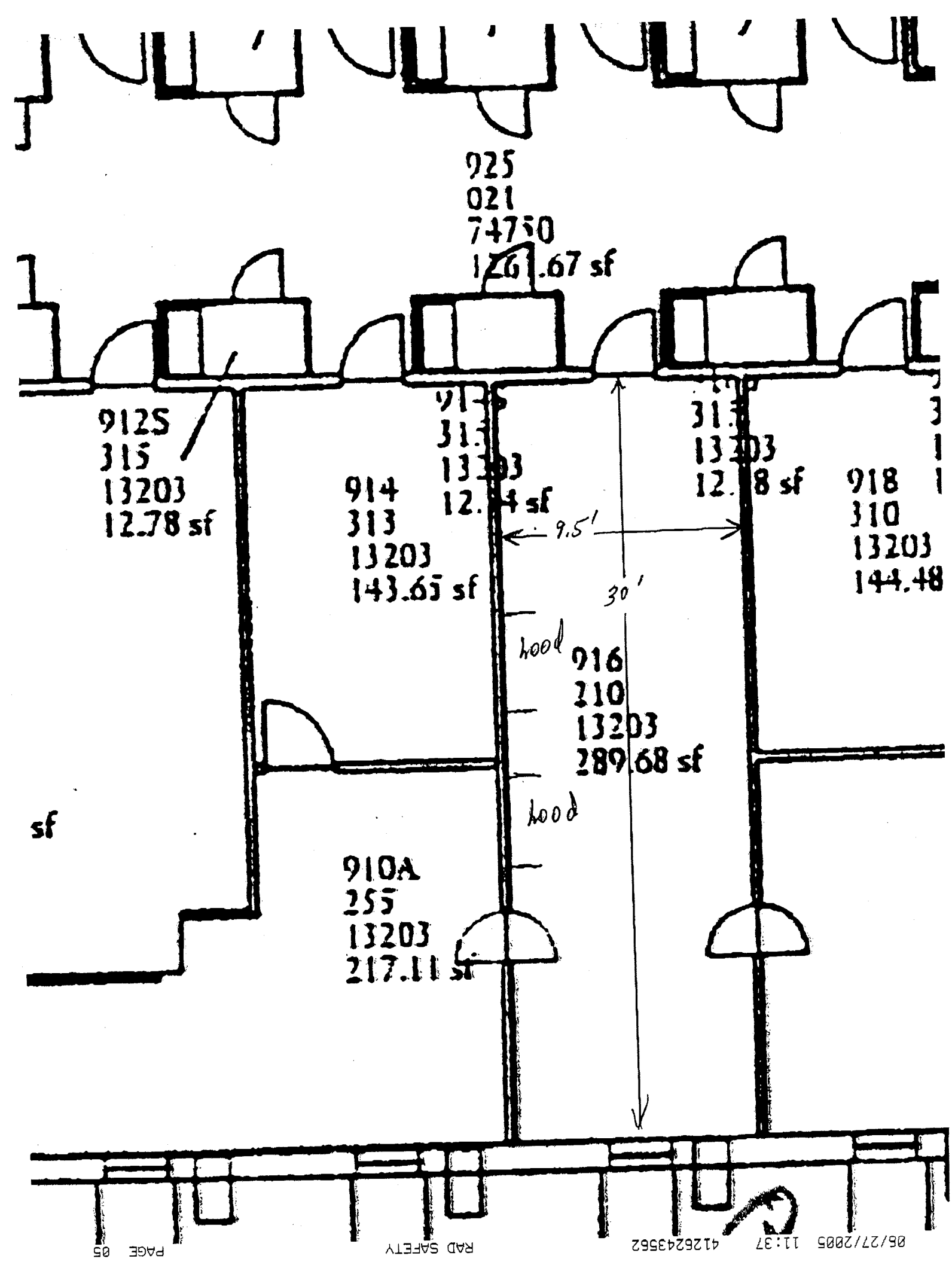
5. The possession limits requested in your licensing action require that you review your decommissioning funding plan and associated financial assurance mechanisms to assure that appropriate financial assurance in accordance with the requirements of 10 CFR 30.35 is maintained. Submit any revisions, as necessary.

The Plan is self funded. No revisions of the are necessary.

Sincerely,

Jerry Rosen
Radiation Safety Officer

cc: N. Wald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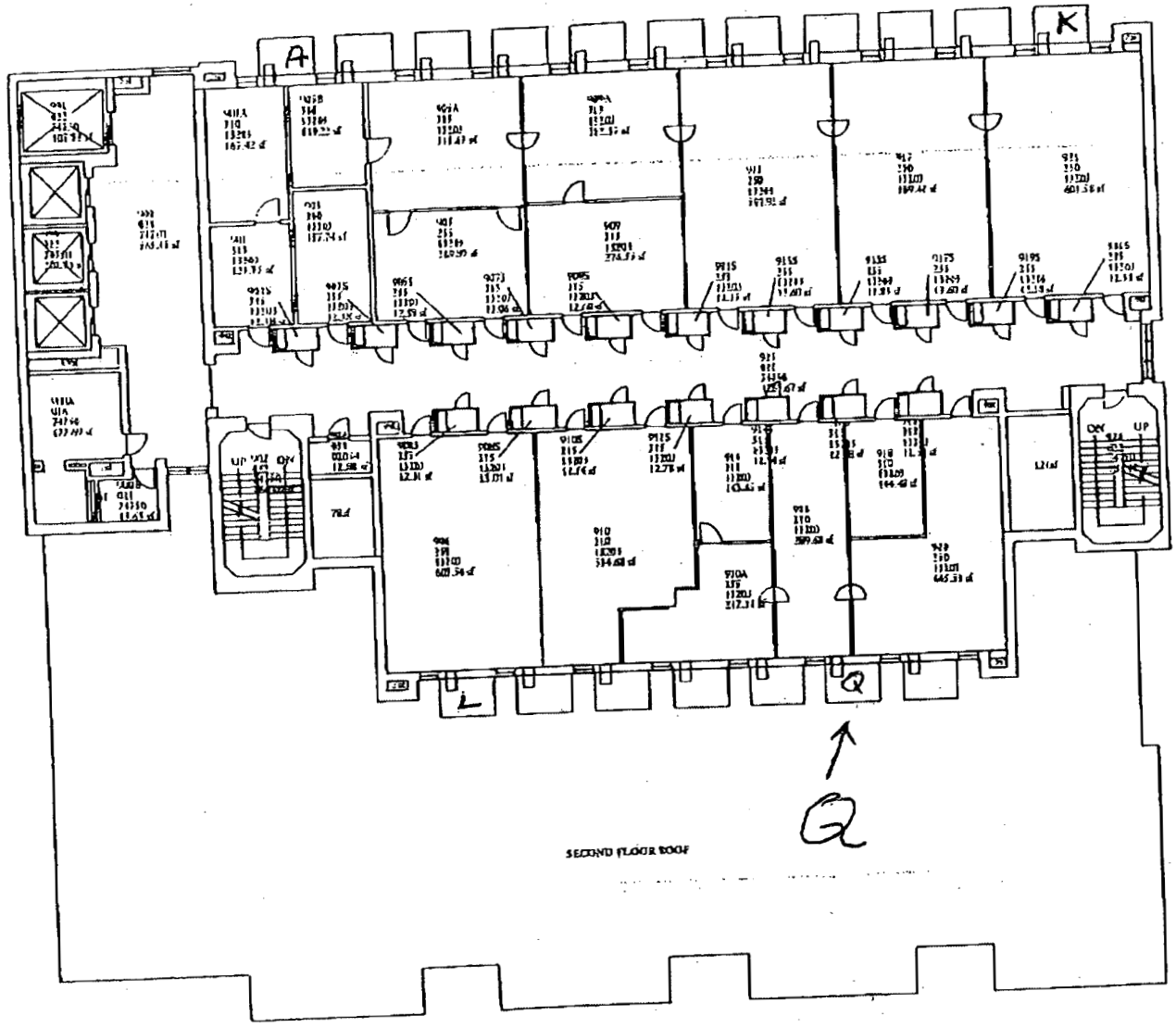

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